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ABSTRACT

Research and development help employers work better with schools to the extent that there is connectivity from one to the other. Project SCANS (Secretary's Commission on Achieving Necessary Skills) Integration has been implemented by the Department of Defense Dependents Schools-Germany. These U.S. schools, teachers, and students are situated in Europe where connectivity might be a particular problem. The major program goal is to provide effective education relative to student preparation for success in the work force by using the SCANS findings. Teachers have recategorized SCANS competencies into two groups--general employability and interpersonal--and selected for each competency the three subcompetencies they would encourage and observe. These comprise the performance checklist for each competency. All teachers in the program are making changes in their classroom instruction that are based on their belief that the SCANS competencies reflect what business and industry want and will expect of their students in the workplace. A number of teachers have noted the strong positive motivational factor of applied learning. The performance checklists are used to establish objectives, align instruction with them, assess competency, and record student performance. No student has been unable to earn competencies. The most notable change in the teaching process has been more small group instruction with more active student participation. Students generally express positive feelings about the program. (YLB)

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RESEARCH AND DEVELOPMENT--DO THEY HELP EMPLOYERS WORK BETTER WITH SCHOOLS?

Paper delivered by Sandra G. Pritz
Center on Education and Training for Employment
The Ohio State University, Columbus, Ohio
at AITD Conference, Port Douglas, Australia
October 5, 1995

Our center's work for the last 30 years has revolved around the title question--both in the United States and increasingly, internationally. Our response to the question is this: research and development help employers work better with schools to the extent that there is **connectivity** from one to the other.

The United States has embarked on a massive action research thrust in the last several years that is focused increasingly on the connectivity of

- academic and technical education
- levels of schooling to form a coherent path (e.g., tech prep)
- schooling to the workplace
- individuals to successful contributing lives
- our economy to global competitiveness (competitiveness, not in the sense of beating another country or of putting them down, but of efficiently and effectively using our earth's resources to maximize the global standard of living)

Our American way is to establish a felt need, to agree on some guidelines at the national level, try to put some systems in place that support the goals, and allow states and local entities to exercise their freedom and rights to work at it in their own way. If we monitor the results carefully, we learn much, share much, and move forward -- action research connects with practice.

The illustrated model of economic development reflects this process and shows the essential elements we think will move us forward. Note that this model is just as valid and applicable to an individual's career planning and development as it is to a nation's or a globe's economic development. The macro picture is nothing more than the amalgamation of many micro pictures.

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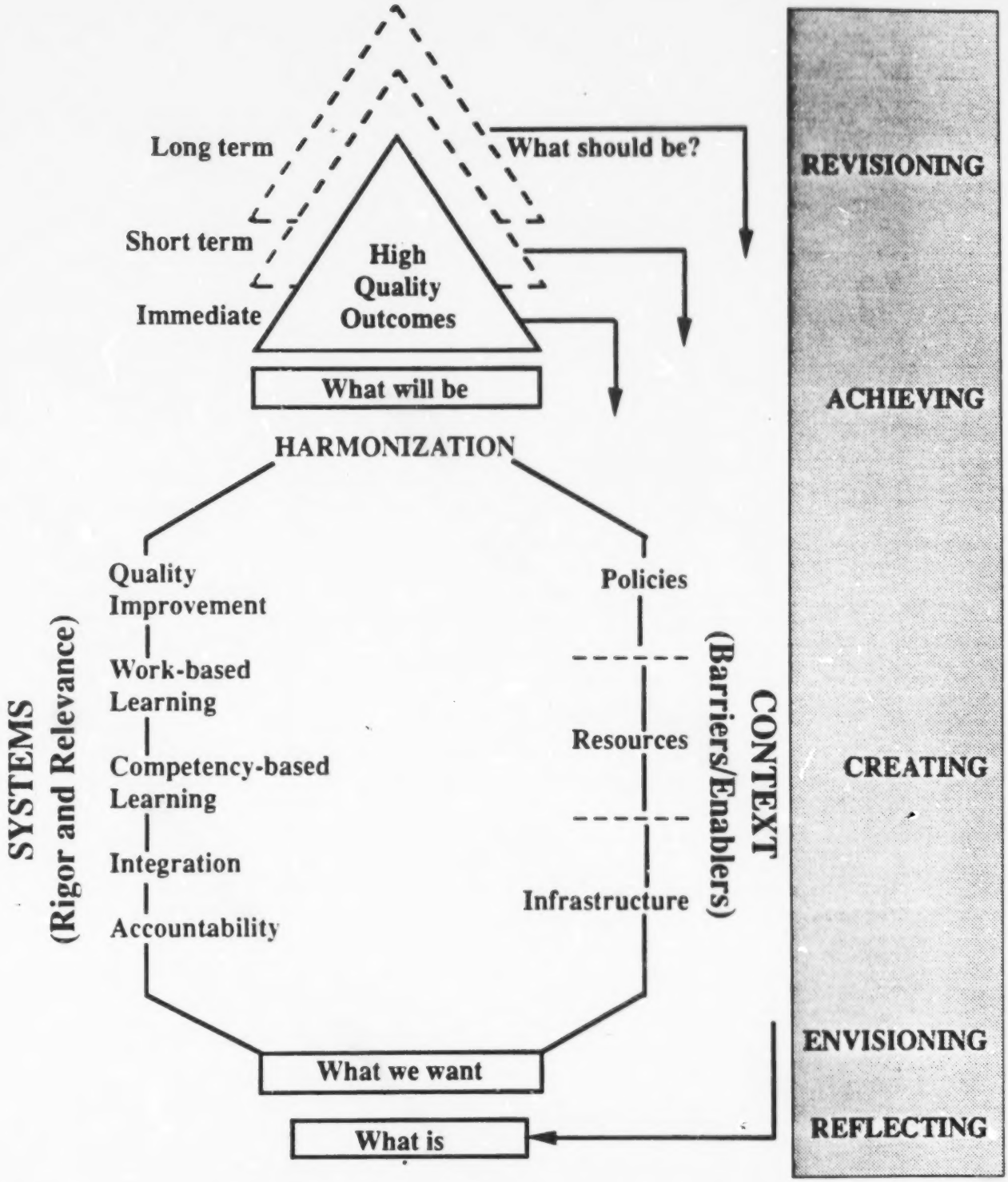

A Model to Enhance Economic Development

Source: Ryan, Ray. Center on Education and Training for Employment, Columbus, Ohio, 1993.

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Next, look at these dimensions of development listed for world societies by an international expert and consider if they are not the essence of what we are promoting for individuals in education and in the workplace:

- **Economic growth**. The indispensable material base for a better life.
- **Equity**. Fair distribution of the fruits of economic expansion.
- **Capacity**. Cultivation of skills, institutions, and incentives that enable societies to sustain improvements and to cope with fresh challenges.
- **Authenticity.** While learning from foreign experience, the distinctive qualities of each society are expressed in its institutions and practices.
- **Empowerment.** Expanded opportunities for individuals and collectivities to participate and make their influence felt in economic and political transactions.

(Source: Milton J. Esman, **Management Dimensions of Development**. West Hartford: Kumarian Press, Inc., 1991.)

Now let's flip to a jarring element in this picture. "... about one-third of young people fail to find stable employment by the time they reach age 30." (Bureau of Labor Statistics and Paul Osterman of MIT.) Where is the connectivity here? Is there not a disconnect between "what is" and "what we want"? This recognition of need has built steadily in our country over the last decade to the point that I believe we have really seen a paradigm shift that is very promising. It was signaled by the release in 1991 of the U.S. Department of Labor's SCANS Commission report **What Work Requires of Schools** which described technical competencies and foundation competencies needed by **all** students. No matter if these were deeply and thoroughly empirically validated (they weren't, and we are about that business now), no matter if they are the definitive generic description (they are so much on target that, in practice, we'll have a long way to go before we need to start quibbling). They have helped in their high visibility to underscore a fundamental shift in the philosophy of education. This shift is from education as desirable for its own sake toward the concept of education as desirable for preparation for people's life work. SCANS is about what pays off the job market! Now I'd like to turn to an example of how we have been using these ideas in secondary schools to close the communication gap between education and work and to enhance connectivity.

The balance of this paper describes a SCANS integration program that is four years old and was set in motion as action research by U.S. DoDDS Europe -- American schools, teachers, and students situated in Europe where connectivity might be a particular problem.

The Usefulness of Identifying What Work Requires of Schools:

Project SCANs Integration

Introduction

Project SCANS Integration is a Department of Defense Dependents Schools (DoDDS)-Germany program initiative currently completing its third of five years of implementation. In 1991 in the United States, the Secretary's Commission on Achieving Necessary Skills (SCANS), Department of Labor, clearly enunciated the expectations employers have for themselves and for future high school and beyond students who eventually seek work. Project SCANS integration was designed to explore the many ways high school instructors can integrate opportunities to learn and earn the desired competencies into their courses and how authentically the competencies can be assessed for their students in an employability context. DoDDS has been discovering some promising answers to those questions. To the best of the team's knowledge, this particular model for applying the findings of the SCANS Commission has not been implemented elsewhere.

Under the direction of Dr. Mahlon Porter, Assistant Chief, Education Division, DoDDS-Germany (now DoDDS-Europe) has been directing multiple school improvement efforts toward outcomes-based instruction and assessment that is compatible with competency-based programming. Planning and teacher training assistance and evaluation has been provided by Dr. Ray Ryan and Sandra Pritz, Center on Education and Training for Employment (CETE) in the College of Education at The Ohio State University. DoDDS-E began experimenting with SCANS outcomes in all 14 curricular areas involving any course, but specified beginning at the 11th and 12th grade levels. A project-specific computer program was developed to support this effort.

Education Division Coordinators began by working with 42 teachers (3 each from the 14 curricular areas) who were willing and able to participate. Teachers were selected from the following disciplines:

Academic and performing arts group
- Arts/Humanities
- Foreign Language
- Language Arts
- Mathematics
- Music
- Science
- Social Studies

Career/Vocational group
- Business
- Computer
- Cooperative Work Experience
- Health/Physical Education
- Home Economics
- JROTC
- Technology

The initial group of teachers began their work in two 1992 week-long workshops. Subsequently, other teachers who have wanted to adopt the program have taken part in a week-long training session. As of 1995, almost 200 teachers have been trained and are participating in approximately 35 schools.

A systematic evaluation effort was considered critical from the outset, to monitor progress, to build in adjustments and enhancements, and to promote communication about the program implementation. A teacher log instrument was introduced in the initial experimental period for data collection purposes. Later, program-specific instruments were developed to collect interview data from administrators, teachers, and students and to structure classroom observations, which were conducted in almost all of the participating schools in April, 1994, and from which many of the findings reported here are derived. The evaluation was conducted according to the CIPP (Context-Input-Process-Product) model (Stufflebeam and Guba, 1970), designed for measuring programs independently in comparison to their stated goals and for emphasizing formative program recommendations.

Enthusiasm for the SCANS Integration Project has run high since the inception of the project. Teachers have been involved in dialogue about strategies for successfully implementing the program to assist students in understanding and preparing for their future work through achieving outcomes in their educational program. Teachers have been open and articulate about their recognition that changes in instructional delivery and assessment are implied by the program, and they have known from the outset that they have the freedom as well as the responsibility to determine what those changes should be.

The Program Goals

The major program goal was enunciated by the Director at the program initiation, namely to provide more effective education relative to student preparation for success in the work force by using the SCANS Commission findings. The vision was presented as an adventure, to learn through exploration and experimentation how best to--

- Integrate competencies from the SCANS recommendations into every course taught in high school grades and then later into middle school and elementary levels

- Identify functional content area competencies in each course that can be included in student progress reports with SCANS competencies as teachers wish

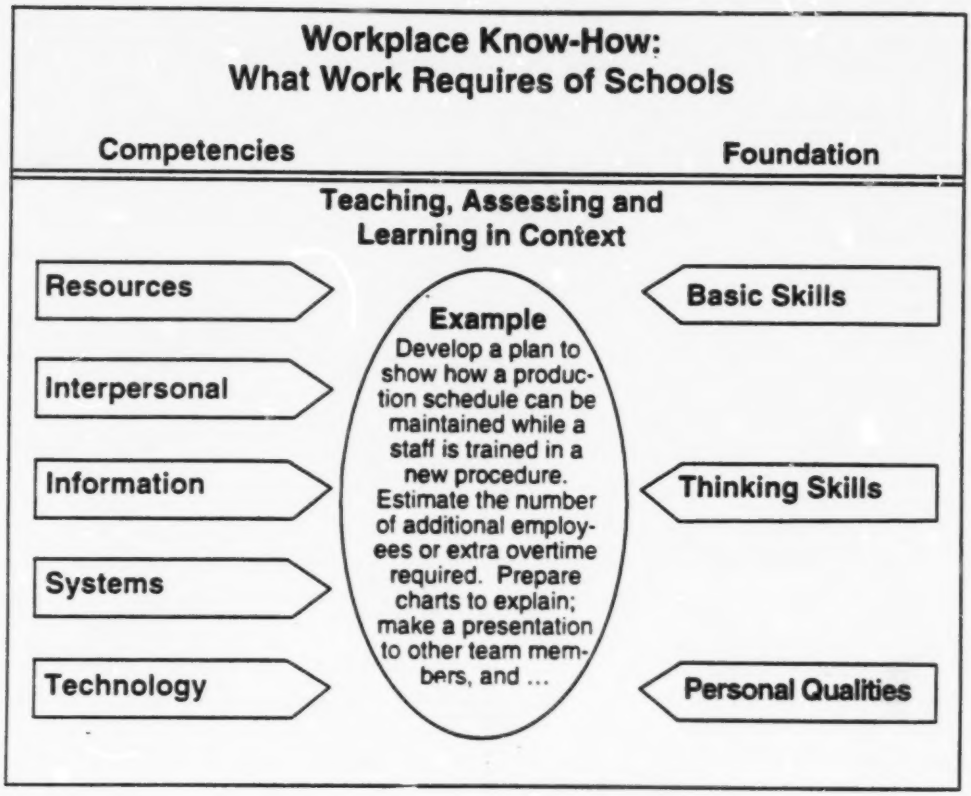
- Manage the recording and reporting of competencies through computer assistance

- Design certificates of competency which students may use as part of a portfolio to present to college registrars and prospective employers

The ultimate objective was then stated to be: to find out if students find the program meaningful and will respond.

The SCANS Competencies Interpreted

The SCANS competencies were declared as necessary skills on the basis of input from large numbers of employers across the United States and across business and industry. The following summarizes the competencies as they were presented in the report, **What Work Requires of Schools** (1991):


Workplace Know-How:
What Work Requires of Schools
Competencies
Foundation
Teaching, Assessing and Learning in Context
Resources
Interpersonal
Information
Systems
Technology
Example
Develop a plan to show how a production schedule can be maintained while a staff is trained in a new procedure. Estimate the number of additional employees or extra overtime required. Prepare charts to explain; make a presentation to other team members, and ...
Basic Skills
Thinking Skills
Personal Qualities

The first challenge to the DoDDS teachers was to make meaning of these competencies in the context of their own classrooms and across all their disciplines. Through systematic group process they gained consensus for their own statements of the competencies, and they recategorized them into two groups: general employability and interpersonal. Next the group selected, for each competency, the three subcompetencies they could all agree to encourage and observe. These comprised the Performance Checklist for each competency and were put into a format that made it usable as tools for instruction, student self-assessment, and teacher assessment. Teachers were encouraged to add other subcompetencies individually as they chose, but a common "language" for the program was established by those shared. A sample Performance Checklist follows:

Name:_____Period__Start Date:_____Finish Date_____

SCANS Performance Checklist
INTERPERSONAL COMPETENCIES

Leadership

The student demonstates competencies in leadership through the organization and coordination of group and individual tasks. The student employs effective communication and listening skills to persuade and motivate others to accomplish goals. The student demonstrates a sensitivity toward individual ideas and beliefs and will generate credibility through competence and integrity.

Directions: Check your skills with the following criteria.
When you feel able to perform the skills, ask your instructor for evaluation.

Student SelfCheck DID YOU...		Instructor Checklist DID THE STUDENT...
	1. Organize group work.	
	2. Involve all group members.	
	3. Set a positive example for others	
	Instructor	
	Finish Date	

In each SCANS-participating classroom, students can choose to work to earn competencies according to the standards set by that teacher. At the end of the course, all competencies earned are printed on a certificate, that is awarded in addition to, rather than instead of, the course grade.

Functional Competencies

The SCANS competencies are all stated so as to be performance-based, that is, observable and measurable. They are functional in nature rather than cognitive, meaning that the focus is on what students can do rather than simply what they know or understand. Because school course content is often expressed in terms of cognitive learning objectives, teachers were asked to practice converting these to functional competencies, which they could incorporate as they chose. The format found helpful to make this conversion follows, with an example from social studies:

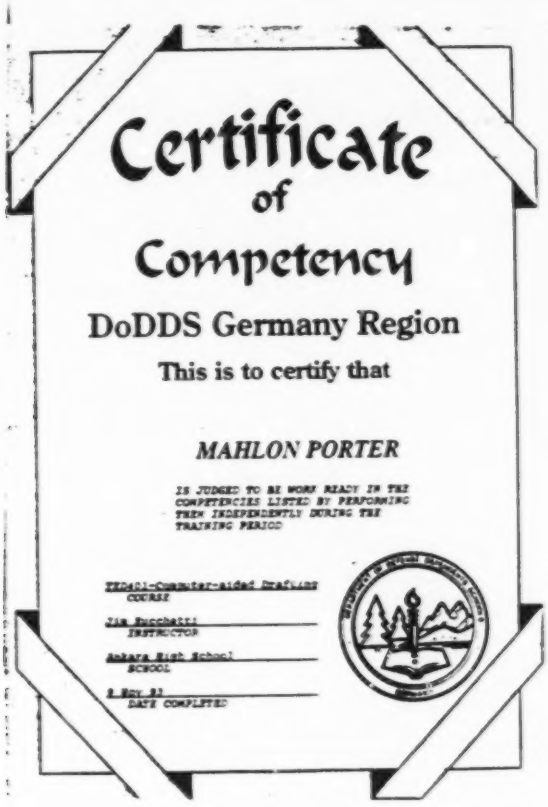
SCANS Code Key

SCANS PROJECT
FUNCTIONAL COMPETENCY IDENTIFICATION FORM

R = resources **Int = interpersonal**
S = systems **Inf = information**
T = technology

Curriculum Content	Learning Objectives	Functional Competency	Code for Comp Type
Map Reading	**Understand the importance of map reading, basic types of maps, map scales, map symbols, grid reference system, elevation, and terrain features.**	**Determine location, distance, and direction on a map and on the ground.**	**S**

The content competencies earned are also printed on the student certificate. A sample certificate follows:



Certificate of Competency

DoDDS Germany Region

This is to certify that

MAHLON PORTER

IS JUDGED TO BE WORK READY IN THE COMPETENCIES LISTED BY PERFORMING THEM INDEPENDENTLY DURING THE TRAINING PERIOD

TT2401-Computer-aided Drafting
COURSE

Jim Bacchetti
INSTRUCTOR

Adara High School
SCHOOL

8 Nov 93
DATE COMPLETED

COMPETENCIES ACHIEVED

COMPUTER-AIDED DRAFTING

COMPUTER APPLICATIONS
- Explain computer-aided drafting and design

ADVANCED TWO-DIMENSIONAL DRAWING (USING PROFESSIONAL CAD SOFTWARE)
- Dimension multi-view drawings

ADVANCED THREE-DIMENSIONAL DRAWING (USING PROFESSIONAL CAD SOFTWARE)
- Develop true 3D wire frame parts
- Develop solid models of 3D wire frame parts

CAD APPLICATIONS
- Configure hardware and software

RESEARCH/DESIGN PROJECT (USING PROFESSIONAL CAD SOFTWARE
- Present the product design to a potential client

GENERAL EMPLOYABILITY

INFORMATION PROCESSING
- Interpret and communicate information

COMPUTER USAGE
- Use a spreadsheet program, database

TECHNOLOGY USAGE
- Set up appropriate machines/equipment
- Use technology to produce a product

RESOURCING
- Schedule time to meet task/project deadlines

WRITTEN COMMUNICATION
- Use correct grammar and spelling in written communication

INTERPERSONAL

LEADERSHIP
- Involve all group members

GROUP DYNAMICS
- Participate as a m of a multiethnic, mixed gender team

PROBLEM SOLVING
- Identify and define problems
- Generate a variety of strategies to solve problems
- Use a variety of strategies to implement plans

DECISION MAKING
- Consider the consequences of action

SELF CONFIDENCE
- Assess/evaluate criticism

SOCIABILITY
- Solve conflict in positive ways

SELF MANAGEMENT
- Evaluate and monitor personal performance

INTEGRITY
- Accept responsibility for own actions

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The Employability Credential

General Employability and Interpersonal Competencies earned in the last two years of high school are compiled on a single sheet in the guidance counselor's office, with a SCANS decal signifying a competency awarded. This credential is shown to college admissions officers and/or potential employers to supplement school transcripts. Research findings indicate that transcripts may be largely ignored by employers (cite source). Early informal evidence indicates that the Employability Credential may be more meaningful to employers, perhaps because it is written in functional workplace terms rather than in cognitive education terms. The record portion of the Employability Credential follows:

RECORD OF SCANS COMPETENCIES EARNED

GENERAL EMPLOYABILITY COMPETENCIES

INTERPERSONAL COMPETENCIES

THIS STUDENT CAN:

	DATE	VERIFIER	AWARD
Information Processing			
1 Select and evaluate information			
2 Select ways to organize information	____	_____	DECAL
3 Interpret and communicate information			
Computer Usage			
1 Use word processing, communications			
2 Use a graphics program, multimedia	____	_____	DECAL
3 Use a spreadsheet program, database			
Technology Usage			
1 Set up appropriate machines/equipment			
2 Produce a product using technology	____	_____	DECAL
3 Maintain and troubleshoot technology			
Resourcing			
1 Schedule time to meet task/project deadlines			
2 Select appropriate human/material resources	____	_____	DECAL
3 Allocate human and material resources to complete a task/project			
Oral Communication			
1 Deliver messages with clarity			
2 Follow oral directions	____	_____	DECAL
3 Participate in group discussions			
Written Communication			
1 Organize thoughts into expressive written form			
2 Proofread, edit and revise written documents	____	_____	DECAL
3 Use correct grammar and spelling in writing			
Reading			
1 Investigate meaning of unknown words			
2 Extract the main ideas of messages	____	_____	DECAL
3 Identify relevant details, facts and specifications from reading			
Mathematics Usage			
1 Use measuring tools and systems			
2 Use basic computational skills	____	_____	DECAL
3 Use graphic formats to display and obtain information			
Systems Usage			
1 Identify the system and its purpose			
2 Monitor and improve performance	____	_____	DECAL
3 Adapt to situational changes			

* A SCANS DECAL indicates that all competencies in the area were demonstrated.

	DATE	VERIFIER	AWARD
Leadership			
1 Organize group work			
2 Involve all group members	____	_____	DECAL
3 Set positive examples for others			
Group Dynamics			
1 Contribute ideas, suggestions and effort for completion of group tasks			
2 Solve conflict in positive ways	____	_____	DECAL
3 Cooperate as a member of a multiethnic, mixed gender team			
Problem Solving			
1 Identify and define problems/issues			
2 Generate and select from alternative stratagies to solve problems	____	_____	DECAL
3 Consider the consequences of actions			
4 Make informed decisions			
Responsibility			
1 Display punctuality and regular attendance			
2 Complete tasks on time and meet deadlines	____	_____	DECAL
3 Take care of materials and equipment; respect the property of others			
Self Confidence			
1 Display confidence in self and work			
2 Demonstrate initiative	____	_____	DECAL
3 Assess/evaluate criticism			
Self Management			
1 Exhibit self control			
2 Work without close supervision	____	_____	DECAL
3 Evaluate and monitor personal performance			
Integrity			
1 Exhibit trustworthy behavior			
2 Respect rights and property of others	____	_____	DECAL
Sociability			
1 Compromise			
2 Exhibit sensitivity to the attitudes, values, and feelings of others	____	_____	DECAL
Personal Identification			
1 Produce a portfolio	____	_____	DECAL
2 Produce a resume			

The Changes in Instruction Promoted by the Program

The teachers involved in the SCANS project are virtually unanimous in voicing their belief that the SCANS competencies reflect what business and industry wants and will be expecting of their students in the workplace. Although this belief is highlighted for some by particular competencies that they have chosen to emphasize (e.g., teamwork), all teachers currently in this program are making changes based on this belief, some large and some small, in their classroom instruction.

The teachers have **not** been told in staff development sessions that they must change their curriculum or their approach to instruction in order to participate in the SCANS project. However, at these sessions they have been engaged in dialogue based on input about competency-based education, authentic and performance-based assessment, and cooperative 'earning. They have shared information about their early experimentation with the project. They have also spent time learning to use software specifically designed to assist them in logging competencies earned by students and in printing certificates at the end of each course.

Given the above, it is interesting that a number of the beliefs that have emerged go beyond the competencies themselves to the teaching principles that would promote the competencies. Some of the following are drawn from the Best Practices Handbook that was compiled by teachers from the synthesis of formative evaluation findings:

- A gap has existed between employer expectations and an awareness of those expectations by both students and educators; therefore, it is important for educators to define expectations about employability and interpersonal competencies and prompt student exploration of them.

- Teachers should retreat from being the sole source of information in the classroom and delegate more responsibility to students for their own learning.

- Performance-based forms of assessment are imperative to draw conclusions about competencies earned; student self-evaluation and interactive assessment are helpful, as is continuing rather than one-time assessment.

- The mastery of SCANS competencies and other curriculum objectives can be supported by selecting supplemental instructional materials from authentic sources and implementing cooperative learning strategies.

- An interdisciplinary approach is beneficial for students to recognize and practice broader application of skills than in one course.

These beliefs are supported by current theory and research on teaching and learning. They would, if thoroughly and consistently implemented, constitute a blueprint for educational reform. Many people have noted how nicely the SCANS project fits with and complements all other educational reform projects being undertaken by DoDDS.

Program Compatibility with the Needs and Characteristics of Students

This program places workplace preparation at the core of educational instruction, and that has been a point of contention over the years in terms of the central purposes of schooling, and in terms of what type of schooling is suitable for different students. The DoDDS student population reflects the entire demographic range; DoDDS educators have needed to be concerned about dropout prevention and education of the disadvantaged as well as strong college preparation and challenging the gifted, as well as all points along the spectrum.

Concerning the issue of student retention and engagement, a number of teachers have noted the strong positive motivational factor of applied learning, students recognizing the relevance of their learning to their future at work, and the reinforcement of small tangible success steps (earning of competencies) as a means to further success and a positive self-image. Some administrators and teachers saw these as the goals of the program. At least three teachers reported strong positive behavioral changes they attribute to the program in students who were considered troublemakers, so that one teacher said this program would be worthwhile if only as a high risk intervention strategy. Some teacher comments include:

- I've seen a fantastic change in those who have been loud, disrespectful, and late to class. Now those behaviors have improved to the point that one has become a teacher's assistant.
- Some of the most passive students have become the most contributing members.
- I had thought this would be a tough class, and SCANS has helped them take responsibility. I've had NO discipline problems, which is quite amazing.
- I never hear "why do I have to learn this" anymore.

For students planning to go to college, many of whom are involved in Advanced Placement (AP) courses, the program seems just as suitable. In fact, several teachers have chosen to implement the SCANS program in an AP course as well as in "regular" courses. When asked about if the effort detracted from AP exam preparation or learning of a large volume of course content, the teachers said:

- I do not have to depart from my curriculum. The expectations are the same for AP students. A college registrar expects some of the same things that an employer does.
- They'll do better on their AP test. For example, they have talked about focusing and prioritizing.
- I started attaching SCANS certificates to college recommendations. Now students ask me if I remembered to include the certificates with their recommendation.
- All students are spellbound when I talk about the workplace.
- Some top students are loners who know the world is waiting for them because they have all the answers. It was hard to sell the program to them, but they've needed it.

The few students who reported discussing the program with their parents said that they were supportive about it serving their future, college and beyond. The most telling student response concerning meeting their needs may be that, when asked for their recommendations for program improvement, the almost invariable answer was to extend the program to all classes and all students.

Program Materials

Because all program materials were developed by the participants specifically for use in this project, they are closely aligned with the program philosophy and goals. All participating teachers have taken part in this process. In addition to an ownership factor, teachers feel contented that they have the flexibility built in to add additional items to the performance checklist for the competency if they so choose. Further, teachers have been given latitude as to which of the competencies they introduce to students, when, and how. So, they have "worked" well for the teachers who are actively involved, and they have been at the core of very impressive ways that teachers are changing their instruction to achieve the program goals.

Content area functional competencies were always intended to be optional and illustrative of the development process. Teachers were also encouraged to develop their own, but not required to do so. However, most teachers who are successfully implementing the project have found ways to integrate the SCANS competencies with their ongoing curriculum rather than simply using the competencies as vehicles for classroom management or for general discussion.

An example is provided by a computer music teacher who has developed content area competencies and has had students write, arrange and copyright music compositions while working on technology usage, computer usage, resourcing, and systems usage competencies. Then in cooperation with an art teacher, students composed original music for an original art animation, taking responsibility for the entire process from story board through performance. Not surprisingly, this teacher sees a great deal of value added for his students in terms of the relevance of their education.

The Record-Keeping System

The performance checklists that were developed in the initial phase of the program have proven to be powerful tools in establishing visible objectives in consonance with program goals, aligning instruction with them, assessing competency (both student self-assessing and teacher assessing), and as a recording device. Because these performance checklists were developed with the SCANS report as the primary reference, they reflect the stated goals directly. The teacher groups processed the definitions and competencies within each SCANS category. Further, all statements on the checklist were required to be observable and measurable functional objectives so that they provided concrete targets.

One of the beneficial effects from the extensive use of the performance checklists is that the students are expected to be responsible for keeping and working from a copy of the checklists related to the competencies undertaken. This is often the copy with the teacher's signature certifying demonstration of that performance, obtained after student self-assessment. Some teachers require more detailed performance specifications than others. For example, some checklists have a written description of the activity conducted to demonstrate each item on the list. In some cases these have been initiated

by the students and approved by the teachers after discussion, and in other cases they have been suggested by the teachers. It should also be noted that in a few classrooms, teachers caught students in the act of demonstrating a competency and awarded it on the spot, with discussion at that point, rather than to set the stage for purposeful work toward the competency.

All involved teachers use some method of logging the competencies earned, either by a duplicate copy of the performance checklists, an entry in the class gradebook, or by entry to the computer system. It has been understood that ultimately it would be important to have computer software to avoid having logging of competencies become cumbersome as the program grew. After some developmental struggles, two options are now available--one a simple-to-use software model (A: COMPT) that will allow teachers to document competencies and print a certificate, and a second, more sophisticated system (Compass) which will also allow teachers to add competencies to the system and to generate reports that include data from the DoDDS Student Information Management System.

Student Progress

It should be stated that no target numbers were established for the pilot test, either for students earning competencies or for number of competencies earned. The intent was to find out if students would be motivated to work to earn competencies and if they would be able to earn them according to standards acceptable to their teachers. No attempt was made to standardize what was considered acceptable performance on a competency from one teacher to another. The obvious outcome is that some teachers were "easier" or "tougher" in awarding competencies, just as with the traditional grading system.

In all classrooms in which the SCANS program was actively implemented, no student was unable to earn competencies, according to both teacher and student report. Students report being interested in working toward competencies according to teachers, and this was confirmed with the students interviewed.

Aside from the progress measured by earning competencies, many (roughly two-thirds of those actively involved) teachers saw student progress in terms of initiative and responsibility, increased teamwork and organization, documentation of work, and/or general engagement. A few teachers reported that other teachers had commented on changes in student behavior [e.g. (Name) is showing more responsibility. (Name) is not so headstrong and feisty.] Some isolated teacher comments include:

- I have feedback that students are thinking about the future.
- There's more focus on cause and effect.
- They are thinking beyond the classroom.
- I want to explode, because they are so much more involved in decision-making and learning. They have better attendance and greater purposefulness of attitude (so do I). They have more mutual respect.

As might be expected, teachers who have been the most actively engaged themselves are the ones who are seeing the greatest evidence of student progress. In cases of half-hearted implementation,

evidence of student progress is scanty. Teachers who have not seen results were often aware that they had not been fully involved themselves, and a number asked for more structure and help from others. (The Best Practices Handbook was developed in response to this type of report, and a cadre of leaders/helpers is planned.)

Teaching Process Changes

Without question, the single most notable change has been from whole class to more small group instruction with more active student participation. Although this change was not mandated in any way, it was an outgrowth of teachers' recognition that students would need to be involved in the kinds of activities that would allow for the observable and measurable competencies to be earned. Thus, they have introduced more project work and have encouraged students to organize their own work to find their own resources.

For teachers who were already moving in this direction in their teaching, perhaps because of other DoDDS initiatives such as cooperative learning, this shift was less dramatic. And most have not found the change to be easy. However, the following examples describe some of the changes:

- I had to work to find opportunities to learn to work together. Now I find it fun. My philosophy has changed dramatically in the last four years. Content is not what is important in the big picture. Students must see that we're convinced it is not in their best interests to have boxed learning. None can go on unless all are successful, and now students invite each other's success. (Spanish I and II)

- I have changed the type of activities from individual design projects to group-oriented design projects where the students have to manage their resources and collaborate on developing a design and presenting it to a panel of experts. (Technology)

- I have incorporated group activities into every course, and it's been really great. I had never done it before. In one class, I even did that for part of the final exam and the students want to do that again. (Mathematics)

- The old way was to challenge them by making it technical and inaccessible. I've revised absolutely everything I used, and I feel less stressed. I'm learning more than they are. It's fun and invigorating. (Health)

These teachers are those who prove the comment of one that "if you are invested in it, it will work."

For some teachers, the main change in their teaching is to place more emphasis on application and on discussing the needs of the workplace. The concept of managing the classroom more like a simulated workplace has been helpful, and relating both content and behavior to what would be true for the workplace. "If they whine, I use employment as the example," was one comment. Another teacher asks one student to be prepared to act as the supervisor each day and to give the class a presentation on the activity for the day and how they should organize to accomplish it.

One administrator is a stellar role model for active involvement in the program. She sees the SCANS program as an excellent way to measure skill development and validate student outcomes, and she decided that students working on a summer hire program (at the American Embassy) could have their work linked to SCANS. A performance evaluation form was developed, and student progress was documented by it. The SCANS competencies were also used as criteria to select the school's "student of the year." She says, "We are ready to go full force."

The program processes are, interestingly, demanding that teachers perform exactly the same competencies that they are helping students to gain. Teachers across all the disciplines recognize the applicability of the competencies to their students' future needs and to their curriculum, although some have been much more successful than others in integrating it fully into their subject area content. This seems to be a function of teacher creativity and resourcefulness rather than of subject area.

Some of the competencies, such as integrity, are most suitably awarded only after an extended period of consistent performance in which a pattern of behavior emerges. Premature award can turn out to be instructionally ineffective. It is important to help students discriminate between one-time performance of a skill, such as successful application of a piece of computer software, and consistent behaviors such as integrity.

The instructional effectiveness of curricular integration across disciplines has been used effectively by some teachers, and this is an area where sharing of strategies may be especially beneficial in the future. Some examples that deserve to be shared include:

- teachers who encourage students to work on competencies beyond their own classroom; students may take the performance checklist to another teacher and negotiate a method for earning it, then negotiate its acceptance with the first teacher.

- an English teacher who had students write narrative for their individual portfolio and then work on a cover and illustrations in their Graphic Arts class. One student then took the design to computer class and generated it from the computer.

- a chemistry and physical science teacher team that teaches once a week with a TST (study of teaching) specialist to involve students in interdisciplinary projects (e.g., design for living on an island that will be feasible 200 years hence).

Those who are involved in interdisciplinary efforts be recruited to the cadre of leaders to assist others in similar efforts.

Student Outcomes

Students interviewed generally expressed positive feelings about the program and wished it could be extended to all courses. (One student said that she knew that was unlikely because it required a lot of change and most teachers don't want to change.) One particularly effective vehicle for students in the classes in which teachers chose to use it has been development of a portfolio that reflects

competence, and this success was clearly linked to the SCANS program, rather than isolated to portfolios.

When asked in what way their SCANS courses differed from others, they indicated being "more prepared and more organized." When asked, "Who's responsible for that?" the emphatic reply was "We are!" In more than one class discussion, students placed considerable emphasis on helping each other to learn and the benefits derived for each party. In a small group setting, students felt able to stop when necessary and get something explained by another student and never feel lost or way behind. A number of students reported learning "better" in various ways.

The solid conclusion is that there are numerous indicators of program effectiveness. This particular set of components links numerous aspects of sound teaching and learning practice, and many of the teachers involved have used considerable dedication, resourcefulness, and creativity to lead the way in demonstrating strategies for successful implementation. The program is in a good position for both continuation and expansion.

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